The second restoration is that of the little four-toed Lower Eocene horse (*Protorohippus venticolus*). This animal in life was about four hands or sixteen inches in height at the withers. The mane is left upright; the forequarters and neck are striped. The body is, perhaps, too large for such very slender and graceful legs.

The third restoration is based on a study of the mounted skeleton of the *Aceratherium*, a hornless form of rhinoceros from the Upper Oligocene formation.

The next picture represents the six-horned *Protoceras*, a Tertiary ruminant from South Dakota, not unlike the North American prong-horn antelope, with soft snout and fleshy upper lip as in the modern saiga.

Metamynodon, an aquatic hornless rhinoceros from the same deposits, affords the subject for a fifth cartoon. The giant pig (*Elotherium*), from South Dakota lake deposits, forms a sixth illustration. The head in the male is of enormous size, but the chest is small and the limbs are extremely tall and stilted. The great projecting flanges below the cheeks, for the attachment of the masseter muscles, presented peculiar difficulties to the artist to represent correctly.

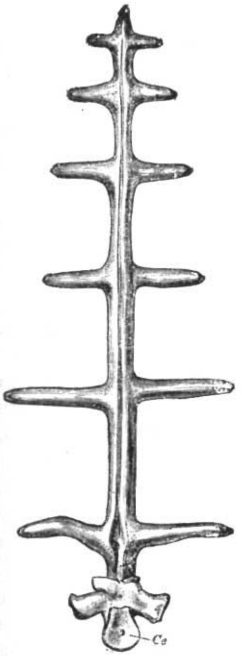

FIG. 5.—Anterior view of a single dorsal vertebra of *Nanosaurus claviger* (nat. size), Cope. Permian, Texas (*Ce*, centrum).

Another striking group is that of the Titanothere, a huge horned pachyderm, of which the male, female and young are depicted. There is no doubt that the females were smaller, and possessed imperfectly-developed horns and narrow zygomatic arches; the males had a pair of extremely long recurved horns, placed transversely on the nasals. In the general structure of the skull, as well as in its dentition, *Titanotherium* (except in the peculiar position of the horns) suggests the modern rhinoceros.

The most striking of these large early Tertiary mammals is undoubtedly the *Uintatherium*, of which Mr. Knight has made an excellent picture. There are quite a number of species of this huge many-horned ungulate, for which the sub-order Dinocerata was proposed by Prof. O. C. Marsh, and on which that author founded an admirable quarto monograph in 1884. Like many American forms it enjoys several generic names, as *Dinoceras*, *Tinoceras*, and *Uintatherium;* the last, being that proposed by Prof. Leidy in 1872, has no doubt the strongest claim to priority.

Three pairs of bony, rounded horn-like protuberances mark the skull; the tusks, which are large, are thought to have been used to draw the branches and leaves of shrubs into the mouth; the skeleton at once suggests that of the elephant, and presupposes a similar hide. A papier maché (life-size) restoration of the skeleton of *Uintatherium* (*Tinoceras*) *ingens*, presented by Prof. O C. Marsh, in addition to Mr. Knight's restoration of *U. cornutum*, grace the Natural History Museum in Cromwell Road.

To these we may add the restoration of *Hyracodon*, a small running form of rhinoceros of as light a build as a modern zebra, but lacking its grace of head.

The tenth restoration is that of a large carnivore *Mesonyx*, which, from the blunted condition of its teeth, suggests that the animal was omnivorous in diet, and that it might have lived partly upon turtles or decaying animal food. The body is represented as large and the legs very short, and therefore not well adapted for the pursuit of living prey.

Palæosyops, a Middle Eocene Titanothere resembling the tapir in habits, with an elongated prehensile upper lip and slender fore-feet, is believed to have inhabited the low marshy lands, feeding entirely upon the softer kinds of leaves and grasses, since its teeth are unadapted to hard vegetable food.

The last restoration is that of the *Mastodon*, which, being so much akin to the elephants of to-day, affords little scope for the imagination in depicting him as a living animal.

The feet are larger and more projecting than in the existing species of elephants, the limbs are relatively shorter, and the head has the low flat skull of the African rather than the high prominent forehead of the Indian elephant.

We cannot fail to congratulate Prof. Osborn on the work upon which he is engaged, and to express the hope that many more of these restorations may be evolved from the fertile invention of the artist, tempered by the careful and chastening influence of the comparative anatomists of the American Museum of Natural History, New York.

JOHN A. R. NEWLANDS.

WE regret to have to record the death of Mr. John Newlands, as a consequence of an attack of influenza, at the comparatively early age of sixty-one. While probably no subject in the whole range of theoretical chemistry has received a greater amount of attention than the numerical relations among the atomic weights of the elements, few among the younger generations of chemists are acquainted with the circumstances attending the establishment of the remarkable generalisation usually known as the "Periodic Law." The contemporaries of Newlands, however, and all who have taken the trouble to look into the literature of the subject, know that it was he who discovered the fundamental relation embodied in this so-called law, and that he clearly expressed the connection between atomic weight and properties about five years before any publication of their views either by Mendeléef or Lothar Meyer. Fortunately the facts stand out from the records clearly enough, but it is difficult now, after a lapse of more than thirty years, to explain the indifference of the chemical world to an observation so remarkable as that to which Newlands drew attention first in the *Chemical News*, August 1864, again more fully in the same journal, August 1865, and a third time more emphatically in a communication to the Chemical Society, March 9, 1866. For many years previously the subject had been, so to speak, in the air. Numerous papers by Dumas, Gladstone, and latterly by Odling, had appeared in which various arrangements of the atomic weights had been adopted, but none of a comprehensive kind; yet when a scheme which consisted not of a number of isolated groups, but which supplied a system covering the whole of the known elements, was brought forward, all that the Chemical Society could do was to reject it with ridicule and contempt, and to decline to print a word of the new doctrine in the then scanty pages of its *Journal*. The unsettled state of opinion in reference to the numerical values of many atomic weights can be the only excuse for what seems like stupidity and prejudice, for Newlands' arrangement required the adoption of the atomic weights standardised as recommended by Cannizzaro in 1864-66, and these values were still unknown to, or ignored by many chemists. Newlands called his scheme the "Law of Octaves," and he showed

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that the fifty-six well-established elements which he was able to consider, when arranged in the order of the magnitudes of their atomic weights, formed eight octaves, each eighth element exhibiting a recurrence of the same or closely similar chemical and physical properties. All this is now acknowledged, but the Chemical Society never did Newlands full justice in the matter; and while the Royal Society awarded the Davy Medal jointly to Profs. Mendeléef and Lothar Meyer for their work on the periodic scheme, it was only some years later, namely in 1887, that the same distinction was conferred, we believe in consequence of Dr. Frankland's representations, upon the discoverer of the law.

They order these things better in France. If Newlands had been a Frenchman, the Academy of Sciences and the Chemical Society, even if they had at first fallen into error, would have taken care that in the distribution of honours their own countryman should not come in last.

John Alexander Reina Newlands, to give him his full name, was the second son of the Rev. William Newlands, M.A. Glasgow, a minister of the Established Church of Scotland, and was born in Southwark in 1837. He was educated privately by his father, and, having early imbibed a taste for chemistry, he entered the Royal College of Chemistry as a student under Hofmann, in October 1856. After a year at College he became assistant to Prof. Way, then chemist to the Royal Agricultural Society. His mother, though born in England, belonged to an Italian family, and the insurrectionary movement under Garibaldi roused the enthusiasm and sympathy of the young chemist to such a pitch that, on the call for volunteers in 1860, he left Way, and went to fight in the cause of Italian freedom, and only returned home at the end of the campaign. He then rejoined Way for a time till, in 1864, he began practice on his own account as analytical chemist in the City. About this time, and for some years later, he taught chemistry at the Grammar School of St. Saviour's, Southwark, at the School of Medicine for Women, and at the City of London College. In 1868 he became chief chemist at Mr. James Duncan's extensive sugar refinery at the Victoria Docks, and remained in that position till 1886, when, in consequence of the decline of the business owing to foreign competition, he joined his brother, Mr. B. E. R. Newlands, in independent practice as analytical and consulting chemists. Mr. Newlands' name was associated with the invention of several important improvements in the refining of sugar, especially, we believe, the so-called alum process for the purification of beet molasses.

In 1884 Mr. Newlands published a small volume containing a reprint of all his papers on atomic weights, with some additions embodying his later views on the same subject. He is also author, jointly with his brother, of a treatise on "Sugar, a Handbook for Sugar Growers and Refiners," and of some articles on "Sugar" in Thorpe's Dictionary.

Mr. Newlands left a widow, a daughter, and a son, Mr. W. P. R. Newlands. The latter studied chemistry at the Royal College of Science, and will take his father's place in the firm.

A kindly courteous man, his face will be much missed by the older Fellows of the Chemical Society, where he had been a familiar figure for so many years.

W. A. T.

PROFESSOR GEORGE EBERS.

PROF. EBERS, the well-known Egyptologist, whose death has recently been announced, will be long remembered in connection with the papyrus which bears his name. Dr. Ebers was born in 1837 at Berlin, and his friendship with Brugsch and Lepsius led him to take a keen interest in Egyptology. In pursuit of his studies he visited Egypt, and it was during the winter of 1872-73, while staying at Thebes, that he had the good fortune to purchase from a native dealer at Luxor the hieratic medical papyrus which made him famous. On his return from Egypt he deposited the papyrus in the University Library at Leipzig, and two years later he published a facsimile of the text, with a description, glossary, &c., in collaboration with his friend Dr. Ludwig Stern. The "Papyrus Ebers," which is in a perfect state of preservation, is the most important medical papyrus that has been found in Egypt, and has thrown considerable light on the medical knowledge of the ancient Egyptians. In addition to his numerous publications on Egyptian archæology, Dr. Ebers gained a considerable reputation as a novelist. In 1889 ill health compelled Dr. Ebers to relinquish his duties as Professor of Egyptology at Leipzig, and from that time till his death he was a confirmed invalid.

NOTES.

THE death is announced of M. N. A. Pomel, of Algiers, Correspondant of the Section of Mineralogy of the Paris Academy of Sciences.

THE Paris Academy of Medicine has received information that a legacy of fifty thousand francs has been bequeathed to it by Mme. C. E. Bragayract.

DR. EVERT JULIUS BONSDORFF, formerly Professor of Anatomy and Physiology in the University of Helsingfors, has just died at the age of eighty-eight years.

M. BROUARDEL will be the president of the French Association for the Advancement of Science, at the meeting to be held next year at Boulogne. General Sébert has been elected vice-president of the Association, and will succeed to the presidency in 1900, when the meeting will take place in Paris.

A REUTER telegram from Naples announces that Mount Vesuvius is in a state of active eruption. The lava is flowing in four streams, its progress being at the rate of 100 yards an hour. The chestnuts on Mount Somma have been burned. Constant explosions are heard from the central crater, which is throwing out volcanic ash, and giving other evidence of activity.

A CONGRESS of the Astronomische Gesellschaft will be opened at the Academy of Sciences at Budapest on September 24. Meetings will also be held on Monday and Tuesday, September 26 and 27. The Hungarian members of the Society have prepared a cordial reception for the astronomers who attend the Congress, among the hospitable features being a luncheon to be given by the Minister of Public Instruction (Dr. Julius von Wlassitz), a dinner by the town of Budapest, visits to places of interest in the town and neighbourhood, and excursions to the O'Gyalla Observatory and the Danube Cataracts—the Iron Doors. The Congress will certainly give a prominent place to the discussion of questions concerning the international zone-catalogue of the Astronomische Gesellschaft; and the resolutions of the Paris Conference, which have given rise to a large amount of criticism, will also be dealt with. Prof. F. Porro will present a preliminary report on the revision of the Piazzi Catalogue of Stars, undertaken by Dr. H. S. Davis and himself.

A COMMITTEE, having upon it many distinguished men of science in Australia has been formed to secure the establishment of some permanent memorial to commemorate the services rendered by the late Baron von Mueller. This movement is entirely distinct from that which the executors of the late Baron have initiated with the object of obtaining funds for the erection of a tombstone. The object of the Committee of the National Memorial Fund is to secure sufficient funds to allow of

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